

### LISTING OF THE CLAIMS

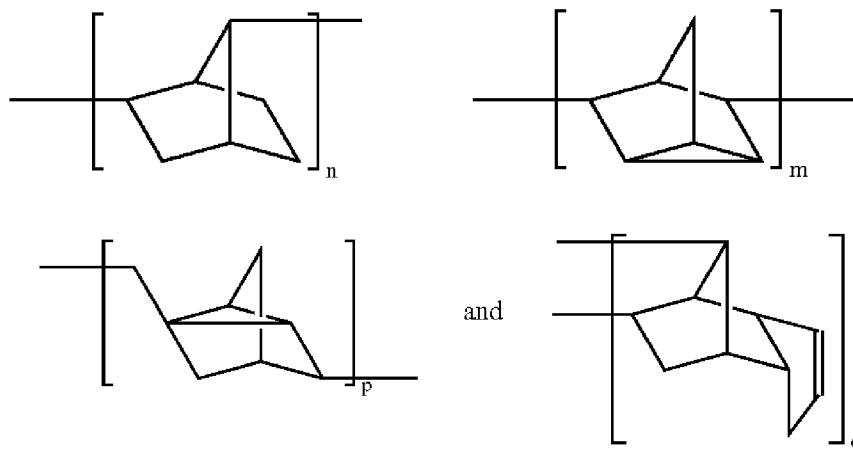
1. (currently amended) A multi-arm star block copolymer composition of matter comprising:

an aromatic core having one or more arms extending therefrom;

wherein each of the one or more arms are formed from a polyisobutylene segment and a cycloolefin or polycycloolefin segment,

wherein the polyisobutylene segment and the cycloolefin or polycycloolefin segment form a repeating unit multiblock copolymer,

wherein the cycloolefin or polycycloolefin segment is selected from the group consisting of one or more of the following formulas:



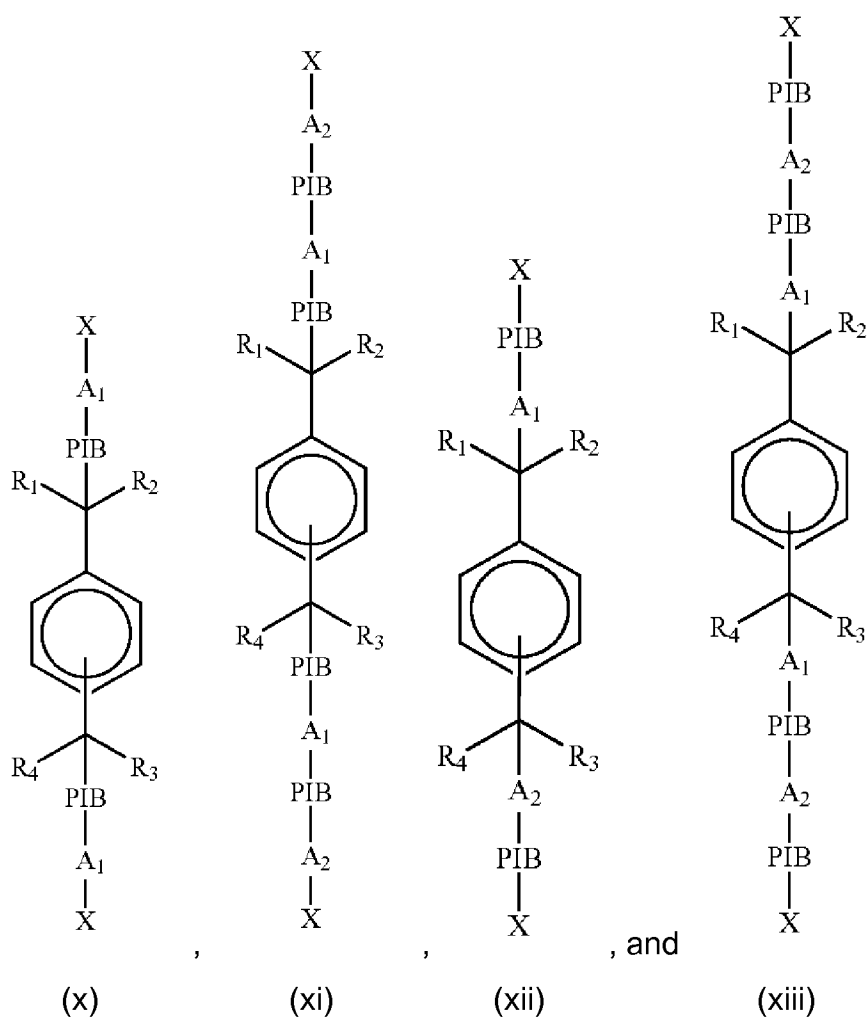
wherein n, m, p and q are all independently-selected integers that are at least 1.

2. (currently amended) The composition of matter according to claim 1, further comprising an aromatic core from which two arms extend, wherein each arm comprises the PIB segment and the cycloolefin or polycycloolefin segment.

3. (original) The composition of matter according to claim 2, wherein each of the arms comprises the same copolymer.

4. (original) The composition of matter according to claim 2, wherein each of the arms is obtained by a living cationic polymerization process.

5. (currently amended) The composition of matter according to claim 2, wherein the composition of matter is represented by the formula selected from the group consisting of one or more of the following formulas:



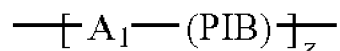
wherein  $A_1$  and  $A_2$  are independently-selected cycloolefin or polycycloolefin segments;

wherein  $R_1$  to  $R_4$  are each independently selected from ~~the group consisting of~~ hydrogen, a methyl group, an ethyl group, and a phenyl group; and

wherein X is selected from ~~the group consisting of~~ -Cl, -Br, -OH, -OCH<sub>3</sub>, -OCH<sub>2</sub>CH<sub>3</sub>, and -OCOCH<sub>3</sub>.

6. (currently amended) The composition of matter according to claim 1, further comprising an aromatic core from which three arms extend, wherein each arm comprises the PEB segment and the cycloolefin or polycycloolefin segment.

7. (currently amended) The composition of matter according to claim 1, wherein the polyisobutylene segment and the cycloolefin or polycycloolefin segment are arranged according to the formula:



wherein Z is an integer that is at least 1, and wherein  $A_1$  is the cycloolefin or polycycloolefin segment.

8. (currently amended) The composition of matter according to claim 1, wherein the polyisobutylene segment and the polycycloolefin segment are arranged according to the formula:



Application Number: 10/561,705  
Reply Dated: December 16, 2009  
Office Action Dated: June 16, 2009

wherein X is an integer that is at least 1, and wherein A<sub>1</sub> and A<sub>2</sub> are independently selected cycloolefin or polycycloolefin segments.

9. (original) A thermoplastic elastomer comprising the composition of matter according to claim 1.

10. (original) An adhesive composition comprising the composition of matter according to claim 1.

11. (original) A coating composition comprising the composition of matter according to claim 1.

12. (original) A method of preparing a composition of matter, the process comprising the steps of:

providing a bifunctional aromatic core;

reacting the bifunctional aromatic core with isobutylene to form a macroinitiator having two arms, said macroinitiator comprising polyisobutylene functionalized at the terminus of each arm;

adding a functional group to the terminus of each arm of the macroinitiator to introduce an active site capable of initiating cationic polymerization of block polymer segments at the terminus of each arm; and

initiating cationic polymerization to form the block polymer segments of each arm, thereby forming a multi-arm star composition of matter having multiblock copolymer arms.

13. (currently amended) The method according to claim 12, wherein the step of initiating cationic polymerization comprises the step of:

cationically polymerizing the multiblock arms, wherein the arms comprise the general formula:

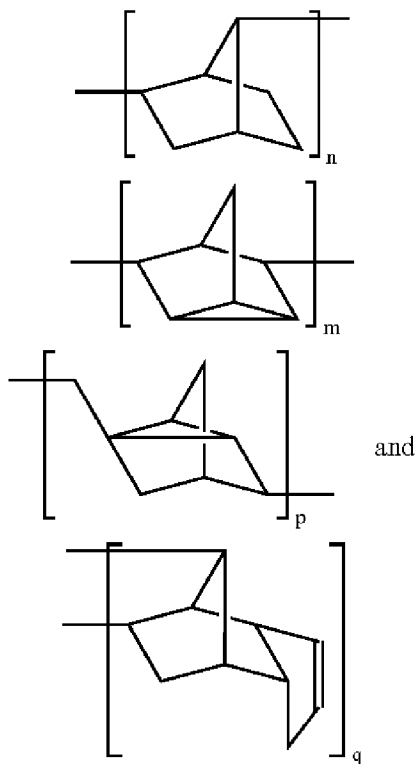
Application Number:  
Reply Dated  
Office Action Dated:

10/561,705  
December 16, 2009  
June 16, 2009



wherein PIB is a polyisobutylene segment;

wherein A<sub>1</sub> and A<sub>2</sub> are cycloolefin or polycycloolefin segment independently selected from the group consisting of one or more of the following formulas:



wherein n, m, p and q are all independently-selected integers that are at least 1.

14. (original) The method according to claim 12, wherein the bifunctional aromatic core is a dicumyl core.

15. (original) The method according to claim 12 further comprising the step of providing a functional group at a terminus of each arm to terminate polymerization of the arms.

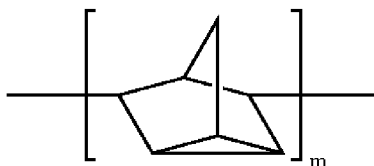
16. (currently amended) The method according to claim 15, wherein the functional group is selected from ~~the group consisting of~~ -Cl, -Br, -OH, -OCH<sub>3</sub>, -OCH<sub>2</sub>CH<sub>3</sub>, and -OCOCH<sub>3</sub>.

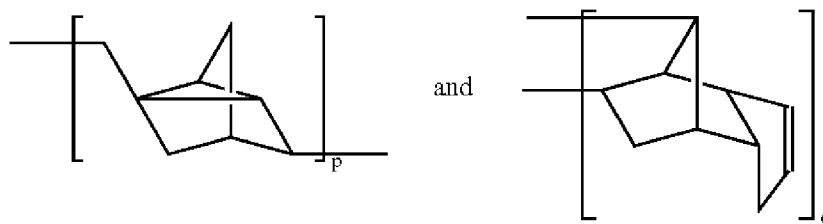
~~16.~~ 17. (currently amended) A thermoplastic elastomer produced by the process of ~~claim 11~~ claim 12.

~~17.~~ 18. (currently amended) An adhesive produced by the method of ~~claim 11~~ claim 12.

~~18.~~ 19. (currently amended) A coating produced by the process of ~~claim 11~~ claim 12.

20. (new) A composition of matter comprising:  
a polyisobutylene segment and a cycloolefin or polycycloolefin segment,  
wherein the polyisobutylene segment and the cycloolefin or polycycloolefin segment form a repeating unit multiblock copolymer,  
wherein the cycloolefin or polycycloolefin segment is selected from one or more of the following formulas:





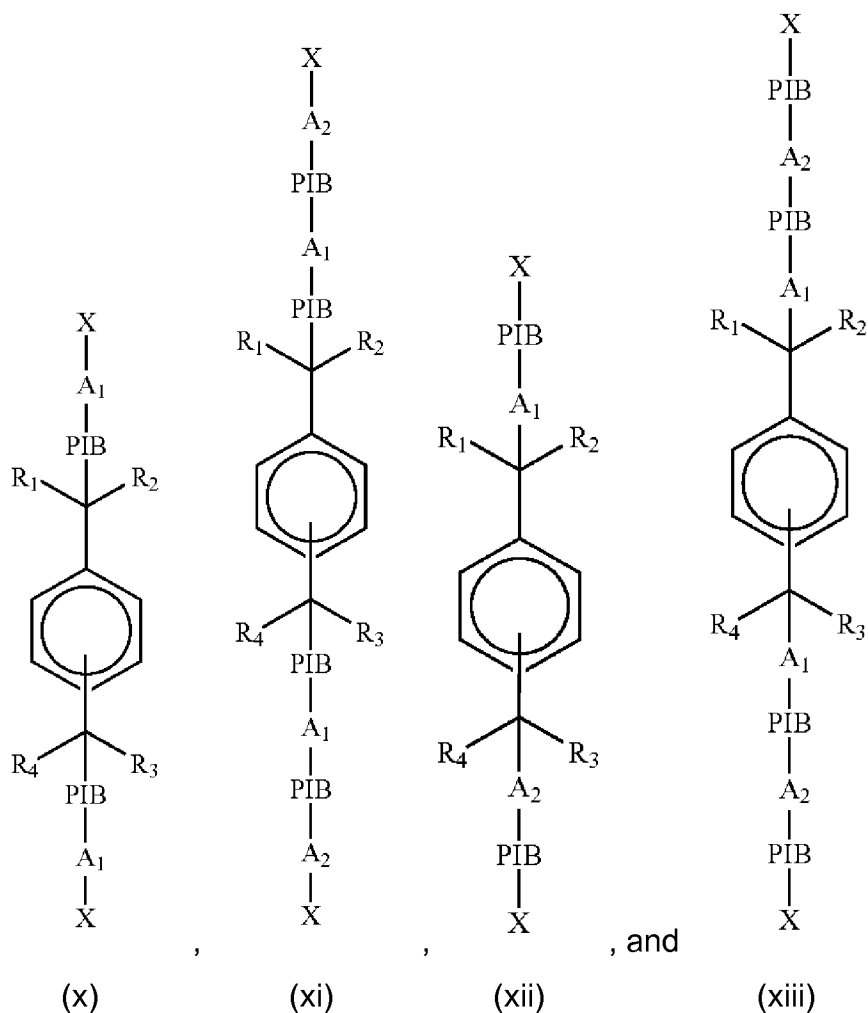
wherein m, p and q are all independently-selected integers that are at least 1.

21. (new) The composition of matter according to claim 20, further comprising an aromatic core from which two arms extend, wherein each arm comprises the PIB segment and the cycloolefin or polycycloolefin segment.

22. (new) The composition of matter according to claim 21, wherein each of the arms comprises the same copolymer.

23. (new) The composition of matter according to claim 21, wherein each of the arms is obtained by a living cationic polymerization process.

24. (new) The composition of matter according to claim 21, wherein the composition of matter is represented by the formula selected from the one or more of the following formulas:



wherein  $A_1$  and  $A_2$  are independently-selected cycloolefin or polycycloolefin segments;

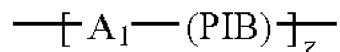
wherein  $R_1$  to  $R_4$  are each independently selected from hydrogen, a methyl group, an ethyl group, and a phenyl group; and

wherein  $X$  is selected from  $-\text{Cl}$ ,  $-\text{Br}$ ,  $-\text{OH}$ ,  $-\text{OCH}_3$ ,  $-\text{OCH}_2\text{CH}_3$ , and  $-\text{OCOCH}_3$ .

25. (new) The composition of matter according to claim 20, further comprising an aromatic core from which three arms extend, wherein each arm comprises the PEB segment and the cycloolefin or polycycloolefin segment.



26. (new) The composition of matter according to claim 20, wherein the polyisobutylene segment and the cycloolefin or polycycloolefin segment are arranged according to the formula:



wherein Z is an integer that is at least 1, and wherein A<sub>1</sub> is the cycloolefin or polycycloolefin segment.

27. (new) The composition of matter according to claim 20, wherein the polyisobutylene segment and the polycycloolefin segment are arranged according to the formula:



wherein X is an integer that is at least 1, and wherein A<sub>1</sub> and A<sub>2</sub> are independently selected cycloolefin or polycycloolefin segments.

28. (new) A thermoplastic elastomer comprising the composition of matter according to claim 20.

29. (new) An adhesive composition comprising the composition of matter according to claim 20.

30. (new) A coating composition comprising the composition of matter according to claim 20.